

EFFECTS OF PREHARVEST SPRAYS OF MCP AND ETHEPHON ON ‘BING’ SWEET CHERRY FRUIT LOOSENING AND FRUIT QUALITY

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ABSTRACT

Looming harvest labor shortages, combined with rapid expansion of sweet-cherry acreage in WA (Table 1), have prompted more effort to investigate the potential for mechanical harvesting of fresh-market sweet cherries. Ethephon, applied a few weeks before anticipated harvest, encourages the development of an abscission layer between the cherry and its pedicel, permitting shake-and-catch mechanical harvesting to be implemented. However, ethephon-treated fruit undergo flesh softening and other changes that shorten postharvest life and accelerate quality deterioration.

Year	Bearing area (ha)	Production (1,000 mt)	F.O.B. Crop value (\$x10⁶)
1995	6,640	64	107
2004	11,700 (+76%)	122 (+91%)	237 (+121%)

In 2002, aminoethoxyvinylglycine, applied on the same day as ethephon but not tank-mixed, did not affect fruit removal force (FRF) at harvest or any fruit quality parameter at harvest or after storage.

In 2003, a formulation of MCP was sprayed on ‘Bing’ sweet cherry trees with a Proptec airblast sprayer a few weeks before harvest. Ethephon was also applied separately on the same date with the same machine. At harvest, 17 days after treatment, sprayed MCP did not influence ethephon-induced reduction in FRF (Table 2). However, sprayed MCP improved cherry flesh firmness at harvest and reversed the negative effect of ethephon on firmness.

Treatment	Fruit removal force (%)	Flesh firmness (%)
Control	100a	100b
SF[®] only	109a	106a
Ethephon	48b	92c
Ethephon + SF[®]	52b	99b

Further work with experimental sprayable formulations of MCP and ethephon on ‘Bing’ sweet cherry in 2004 and 2005 using the same application technology did not confirm the observations obtained in 2003. In both years, the MCP treatment did not offset the negative effect of ethephon on flesh firmness.

In fall, 2005, a comparison was made in apple between a handgun, dilute application of MCP vs. a similar per-acre rate applied at 935 l/ha with the Proptec airblast sprayer. The handgun application appeared to be more effective for controlling fruit maturation, C₂H₄ evolution and retaining post-storage fruit condition than the airblast application. This observation suggests that the physical delivery of the normally gaseous MCP molecule in an aqueous solution to plants may be materially improved by application technology that maintains larger droplet size and/or wets foliage more thoroughly. As spray droplet volume increases, droplet surface-area/volume ratio decreases exponentially, possibly retarding gaseous diffusion losses of MCP prior to solution contact with the plant and/or improving MCP uptake. The potential importance of high-volume application for effective MCP treatment in sweet cherries is being investigated in 2006.

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